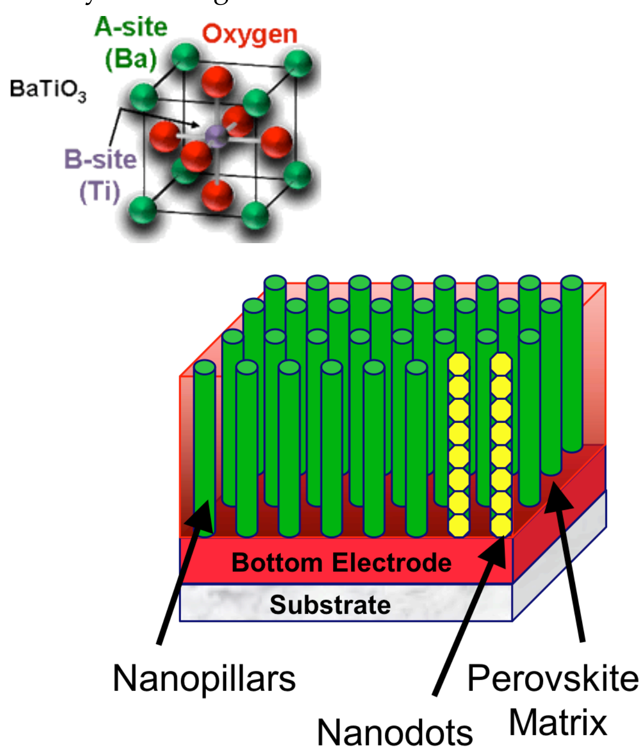
Ramesh Wins MRS Turnbull Award for Multi-Ferroics Research

MSD investigator Ramamoorthy Ramesh was awarded the 2007 Materials Research Society's Turnbull Lectureship for "his pioneering contributions to the materials science of complex oxide heterostructures and nanostructures, including multiferroics, ferroelectrics,and magnetoresistive oxides; and for his enthusiasm and leadership in conveying the excitement of this field to a broad audience."

The David Turnbull Lectureship is one of the society's most prestigious awards and recognizes scientists who have made outstanding contributions to understanding materials phenomena and properties through research, writing, and lecturing. As the 2007 recipient, Ramesh discussed his work ("Whither Oxide Electronics?") at a plenary session of the MRS Fall Meeting.

Ramesh is known internationally for his work with "multi-ferroics," materials which possess two or more of the primary ferroic properties (e.g. ferroelectric, ferromagnetic, or ferroelastic). One of his landmark contributions was the recognition that conducting oxide electrodes could be used to avoid "polarization fatigue" in these materials, thus overcoming a 30-year-old barrier to their implementation in memory and logic devices. This research had worldwide impact: many industrial and academic research laboratories have implemented the approach and the first series of products based on the use of conducting oxide electrodes is now reaching the marketplace. In the mid-1990s, Ramesh initiated research into manganite thin films and was a co-discoverer of the Colossal Magnetoresistive (CMR) effect. The *Science* paper that described this discovery is that publication's fourth most-cited paper, with more than 2000 citations.

Ramesh has continued research activity in multifunctional materials, with an emphasis on oxide electronics. He is, for example, working on multi-ferroic based circuits that could exploit deterministic control of magnetism with an electric field, leading to opportunities for new materials physics as well as a new generation of electrically controlled magnetic devices for storage, logic and sensing.



Magnetism controlled by electric fields rather than by current.
Piezoelectric matrix (e.g. $BaTiO_3$) changes shape in an electric field, affecting the magnetism of the ferromagnetic nanopillars.

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